Survival Impact of National Accreditation Program for Rectal Cancer Treatment Timing Standards

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INTRODUCTION

- NAPRC established in 2017
- Significant variation in all aspects of rectal cancer care in the US
- NAPRC Goal:
  - Decrease variation in treatment and outcomes for rectal cancer patients by standardizing care
  - Established 13 treatment standards for cancer care
- One standard is definitive treatment within 60 days of diagnosis
- Study questions:
  - Does timely treatment within 60 days of diagnosis improve outcomes?
  - Which factors are associated with receiving timely care?

METHODS

NATIONAL CANCER DATABASE

INCLUSION CRITERIA

- Rectal cancer patients
- Received definitive treatment
- 2004-2020
- n = 387,099

EXCLUSION CRITERIA

- Stage IV disease
- Palliative care
- Unknown time from diagnosis to treatment

ANALYSIS COHORT
n = 150,283

FIGURE 1 **Cohort selection**

T and chi-square tests used to compare cohorts

Logistic Regression Model used to identify variables associated with timely treatment

Kaplan-Meier and Cox Regression used for survival analysis

CONTACT INFORMATION

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RESULTS

*p-value significant for all variables	All Patients (150,283)	Timely (125,435)	Delayed (24,848)
Age (median, IQR)	62 (53-72)	62 (52-71)	64 (56-73)
Sex			
Male	92,018 (61.2%)	76,577 (61.0%)	15,441 (62.1%)
Female	58,265 (38.8%)	48,858 (39.0%)	9,407 (37.9%)
Race			
White	128,600 (85.6%)	108,714 (86.7%)	19,886 (80.0%)
Black	12,625 (8.4%)	9.473 (7.5%)	3,152 (12.7%)
Asian	5,607 (3.7%)	4,524 (3.6%)	1,083 (4.4%)
Other	2,270 (1.5%)	1,768 (1.4%)	502 (2.0%)
Unknown	1,181 (0.8%)	956 (0.8%)	225 (0.9%)
Insurance			
Private	68,394 (45.5%)	59,514 (47.5%)	8,880 (35.7%)
Medicare	60,892 (40.5%)	49,671 (39.6%)	11,221 (45.2%)
Medicaid	10,610 (7.0%)	8,111 (6.5%)	2,499 (10.1%)
Not Insured	5,511 (3.7%)	4,399 (3.5%)	1,112 (4.5%)
Other	2,516 (1.7%)	1,808 (1.4%)	708 (2.8%)
Unknown	2,360 (1.6%)	1,932 (1.5%)	428 (1.7%)
Income			
<$38,000	23,088 (15.4%)	18,596 (14.8%)	4,492 (18.1%)
$38,000 – 47,999	31,942 (21.2%)	26,498 (21.1%)	5,444 (21.9%)
$48,000 – 62,999	36,348 (24.2%)	30,435 (24.3%)	5,913 (23.8%)
≥$63,000	42,125 (28.0%)	35,979 (28.7%)	6,145 (24.7%)
Unknown	16,781 (11.2%)	12,927 (11.1%)	2,854 (11.5%)
Treatment Area			
Metropolitan	118,910 (79.1%)	99,087 (79.0%)	19,823 (79.8%)
Urban	22,956 (15.3%)	19,264 (15.4%)	3,692 (14.9%)
Rural	3,100 (2.1%)	2,641 (2.1%)	459 (1.8%)
Unknown	5,317 (3.5%)	4,443 (3.5%)	874 (3.5%)
Facility Type			
Comprehensive Com.	55,174 (36.7%)	47,342 (37.7%)	7,832 (31.5%)
Academic/Research	49,348 (32.8%)	38,822 (31.0%)	10,526 (42.3%)
Integrated Network	29,646 (19.7%)	25,232 (20.1%)	4,414 (17.8%)
Community	10,019 (6.7%)	8,540 (6.8%)	1,479 (6.0%)
Unknown	6,096 (4.1%)	5,499 (4.4%)	597 (2.4%)
Charlson Comorbidity			
0	115,954 (77.2%)	97,509 (77.7%)	18,445 (74.2%)
1	24,627 (16.4%)	20,325 (16.2%)	4,302 (17.3%)
≥2	9,702 (6.4%)	7,601 (6.1%)	2,101 (8.5%)
Treatment			
Chemotherapy/XRT	76,754 (51.1%)	66,842 (53.3%)	9,912 (39.9%)
Surgery	35,714 (23.8%)	28,303 (22.5%)	7,411 (29.8%)
Chemotherapy	19,554 (13.0%)	15,015 (12.0%)	4,539 (18.3%)
Radiation	8,274 (5.5%)	6,448 (5.1%)	1,826 (7.3%)
TNT	9,839 (6.5%)	8,724 (7.0%)	1,115 (4.5%)
Immunotherapy	148 (0.1%)	103 (0.1%)	45 (0.2%)
Time to Treatment	34 (22-49) days	31 (20-41)	77 (66-97)

TABLE 1 **Demographic Variables of Cohort by Treatment Timeliness**

* significant variable in model	Odds Ratio	95% CI
NAPRC: Not instituted (ref) *	0.62	0.60 – 0.65
Sex: Male (ref) *	1.06	1.03 – 1.09
Charlson-Deyo: 0 (ref)		
1 *	0.94	0.91 – 0.98
≥2 *	0.80	0.76 – 0.81
Race: White (ref)		
Asian *	0.87	0.80 – 0.95
Black *	0.60	0.57 – 0.63
Other *	0.78	0.70 – 0.88
Unknown *	0.82	0.69 – 0.97
Disease Stage: Stage I (ref)		
Stage II *	1.30	1.24 – 1.36
Stage III *	1.48	1.41 – 1.55
Insurance: Private (ref)		
Medicaid *	0.61	0.57 – 0.64
Medicare *	0.86	0.82 – 0.90
Not Insured *	0.74	0.68 – 0.81
Other *	0.46	0.41 – 0.51
Income Bracket: <$38,000 (ref)		
$38,000 – 47,999	1.03	0.98 – 1.08
$48,000 – 62,999 *	1.08	1.02 – 1.14
≥$63,000 *	1.27	1.20 – 1.35
Unknown *	1.09	1.01 – 1.17
Treatment Area: Metropolitan (ref)		
Urban *	0.92	0.87 – 0.97
Rural *	0.91	0.83 – 1.00
Unknown	0.95	0.86 – 1.06
Facility Type: Community (ref)		
Comprehensive Com.	0.95	0.87 – 1.05
Academic/Research *	0.63	0.57 – 0.70
Integrated Network	0.95	0.85 – 1.05
Unknown	1.07	0.94 – 1.22
Treatment: Surgery (ref)		
Chemotherapy/Radiation *	1.45	1.38 – 1.53
Chemotherapy *	0.90	0.85 – 0.96
Radiation	0.94	0.87 – 1.01
TNT *	2.12	1.95 – 2.31
Immunotherapy	0.73	0.50 – 1.04

TABLE 2 **Logistic Regression for Treatment Timeliness**

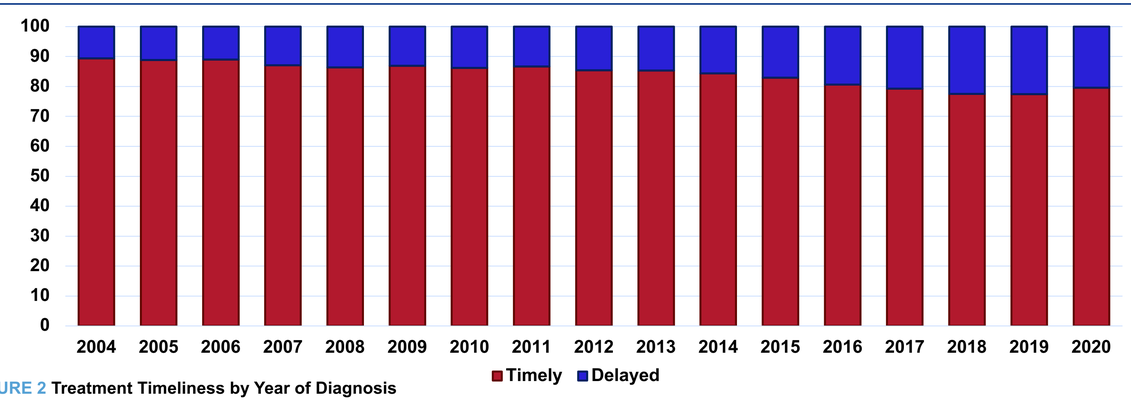
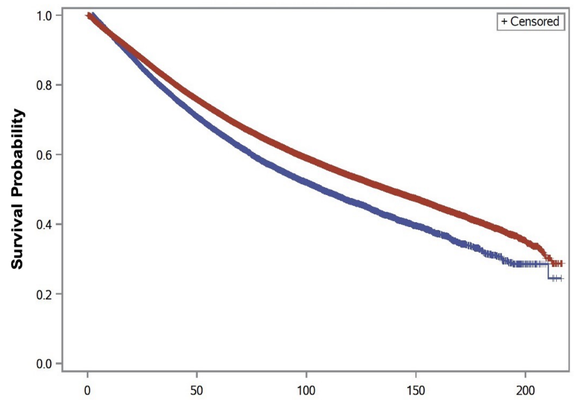


FIGURE 2 **Treatment Timeliness by Year of Diagnosis**



Median overall survival
Delayed: **106.84 m** (95% CI 103.89 – 110.23)
Timely: **137.30 m** (95% CI 135.39 – 139.07)

FIGURE 3 **Overall Survival by Timeliness of Treatment Initiation**

DISCUSSION

- Significant disparities prevent timely initiation of rectal cancer treatment
  - Demographic: Race, Socioeconomic Status
  - Treatment: Facility Type, Treatment Type
- Logistic regression model
  - Academic facility, Treatment type significant
- Timely initiation of treatment within 60 days of diagnosis improves survival
  - Confirmed with Cox Regression (HR=0.954) controlling for age, sex, race, insurance, income, facility and treatment
- Delivery of timely care decreased over the study period
- Increasing complexity of rectal cancer treatment associated with treatment delays

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